

# Sexually Dimorphic Membracidae from Southern Africa

by

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Up to the present it has been thought that sexual dimorphism was of rare occurrence in Membracidae, and only one such species, *Platybelus brunneus* Funk (1934) has so far been described from Africa. Thanks to the kindness of Dr. H. K. Munro of the Division of Entomology, Dept. of Agriculture, Union of South Africa I was able to borrow the type (♀) and paratype (♂) from the National Collection of Insects, Pretoria, and on examining them I found that Funkhouser's figures were not accurate. I have therefore prepared new drawings of this species from the types, which are here reproduced.

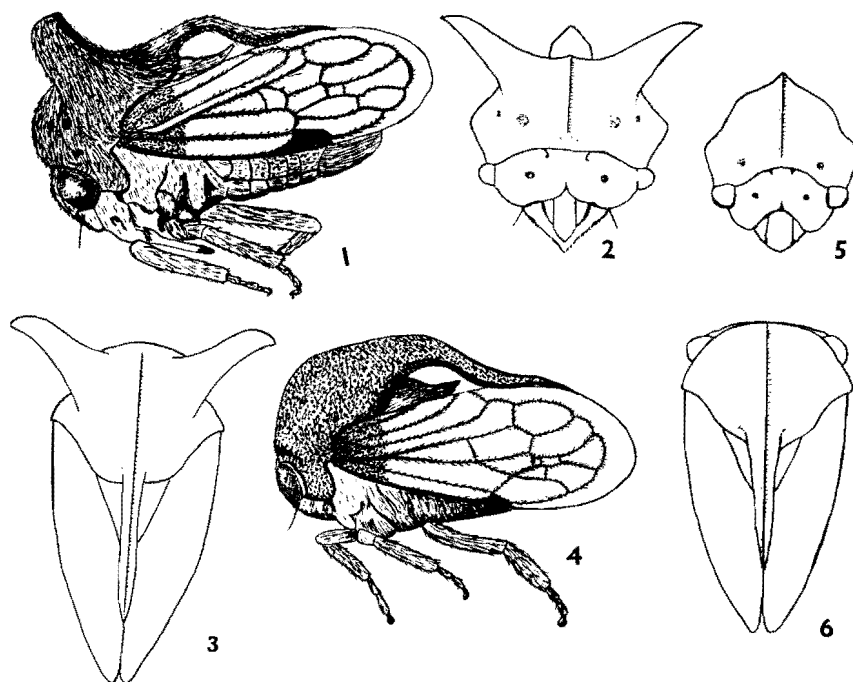
It seems necessary to point out the presence of a tegminal pterostigma in this species, which was not mentioned by Funkhouser in his description, or shown in his figures. He has stated (1951: p.271) that the presence of a stigma on the tegmen is a very rare feature in Membracidae. This is not so as far as African species are concerned, for it is present in many genera and in my opinion is of great systematic importance. I believe that further study will show that it can be safely used in the working out of a more natural classification.

The present grouping of African species seems to me to be very muddled, and much material is needed for study before any attempt can be made to bring order out of the present chaos. For this reason the six new species herein described have been arranged alphabetically rather than grouped according to the artificial divisions suggested by past workers.

## **Centrotus hobohmi** sp. n.

Female near *C. bantuantus* Dist. but differing in the more rounded, more backwardly directed suprahumeral horns and in the more sinuous posterior process. The male is unlike any previously described species in the absence of suprahumeral horns.

**Female:** *Head* subquadrate, about three times wider than long, black, finely punctate, shortly goldenly pilose; base strongly arcuate; eyes large, prominent, brown, mottled with piceous; ocelli dark, sunken, about as far from each other as from the eyes and situated about on a line drawn through the centres of the eyes; a bare depression above each ocellus just below the



Explanation of figures 1 to 6.

1.	<i>Platybelus brunneus</i> Funk.	♀	Lateral view.
2.	"	♀	Frontal outline.
3.	"	♀	Dorsal outline.
4.	"	♂	Lateral view.
5.	"	♂	Frontal outline.
6.	"	♂	Dorsal outline.

base; inferior margins of genae slightly downwardly sloping; postgenae whitely tomentose; clypeus about twice as long as broad, shortly lobate at base and extending below margins of genae for nearly three quarters of its length, shortly goldenly pilose at base, whitely, more longly pilose to its rounded tip; rostrum brown, finely whitely pilose, reaching to intermediate coxae, base thickly whitely tomentose; antennae with basal joint ochraceous, base of flagellum black becoming ochraceous towards tip.

**Thorax.** *Pronotum* black, finely punctate, shortly goldenly pilose; metopidium moderately high, wider than high; suprahumeral horns well developed, outwardly and slightly upwardly directed, broad at base, somewhat dorso-ventally compressed, about as long as the distance between their bases, tips blunt and rounded, lateral margins strongly carinate, a short dorsal carination close to posterior margin; posterior process strong, reaching well beyond the inner angle of the tegmina, tricarinate, strongly punctate, shortly sparsely goldenly pilose above, sparsely and more longly pilose below, rising well above scutellum, slightly declivous, acuminate and slightly sinuous to

apex, strongly centrally percurrent; humeral angles slightly more prominent than the eyes, blunt; sides of thorax thickly, whitely tomentose, showing palely through the tegmina at their bases. *Tegmina* about two and a half times as long as wide, pale amber at tips, becoming paler in centre, base coriaceous, tips gradually rounded, somewhat wrinkled, veins brown and well defined, sparsely finely pilose, five apical and three (occasionally two) subapical cells, apical limbus somewhat narrow. *Wings* with four apical areas, veins well defined and dark brown shading to ochraceous at bases. *Legs* black, coxae somewhat whitely tomentose, tarsi and tibiae brown, somewhat pilose, posterior tibiae armed with very short spines. *Scutellum* fully exposed, wider than long, dark brown, tip bifid, basal angles thickly tomentose, finely punctate, whitely pilose, pilosity running at right angles to median line, apices ochraceous. *Abdomen* above greyish, deeply punctate, posterior margins of tergites ochraceous; below, black with silvery pubescence, whitely tomentose especially along the pleura. Length 8 mm., width across suprahumeral 5.5 mm., width across humeral angles 4 mm.

**Male:** Similar to ♀ except that the suprahumeral horns are entirely absent. Length 7 mm. Width at humeral angles 3.5 mm.

**Nymph** (last instar) grey or reddish brown, almost entirely covered above with minute whitish tubercles which usually terminate in white hairs. *Head* about two and a half times as wide as long, creamily tuberculately pilose; two pairs of tumid nodules on base; eyes not prominent; ocelli dark and sunken, about equidistant from each other and from the eyes, and about on a line drawn through the centres of the eyes; a moderately deep central suture and a short diagonal cleft from the internal bases of the central pair of nodules to just above the ocelli; clypeus horizontal; rostrum reaching to base of posterior coxae. *Thorax:* Pronotum rising highly to a helmet shaped crest, forwardly curved but not extending beyond the cephalic margin, thence rounded and backwardly and downwardly curved to terminate in an acuminate posterior process which extends over two thirds of the mesanotum; suprahumeral buds well developed; mesonotum with a pair of nodules on either side of the tip of the posterior process; wing pads well developed but not prominent; legs marginally strongly tuberculate. *Abdomen:* segments not very clearly defined above, second visible tergite bearing a distinct tubercle on either side of the median line, these tubercles appear on tergites three to seven forming a ridge; a second tuberculate ridge runs parallel with the first between it and the lamellae; lamellae well developed on the third to seventh segments, strongly pilose; anal tube longer than the other abdominal segments together; ventral surface ochraceous, segments clearly defined, pleura shortly pubescent; anal tube widely grooved below.

Holotype ♀, allotype ♂, 9 ♀, 4 ♂ paratypes and 13 nymphs from Abachaus, Otjiwarango, South West Africa, collected by Mr. G. Hobohm in March, 1950, and 1951.

Holotype and allotype in Transvaal Museum, paratypes in author's collection and British Museum.

**Host Plant:** *Terminalia sericea*.

I have great pleasure in dedicating this species to Mr. G. Hobohm, who has collected much valuable material from South West Africa.

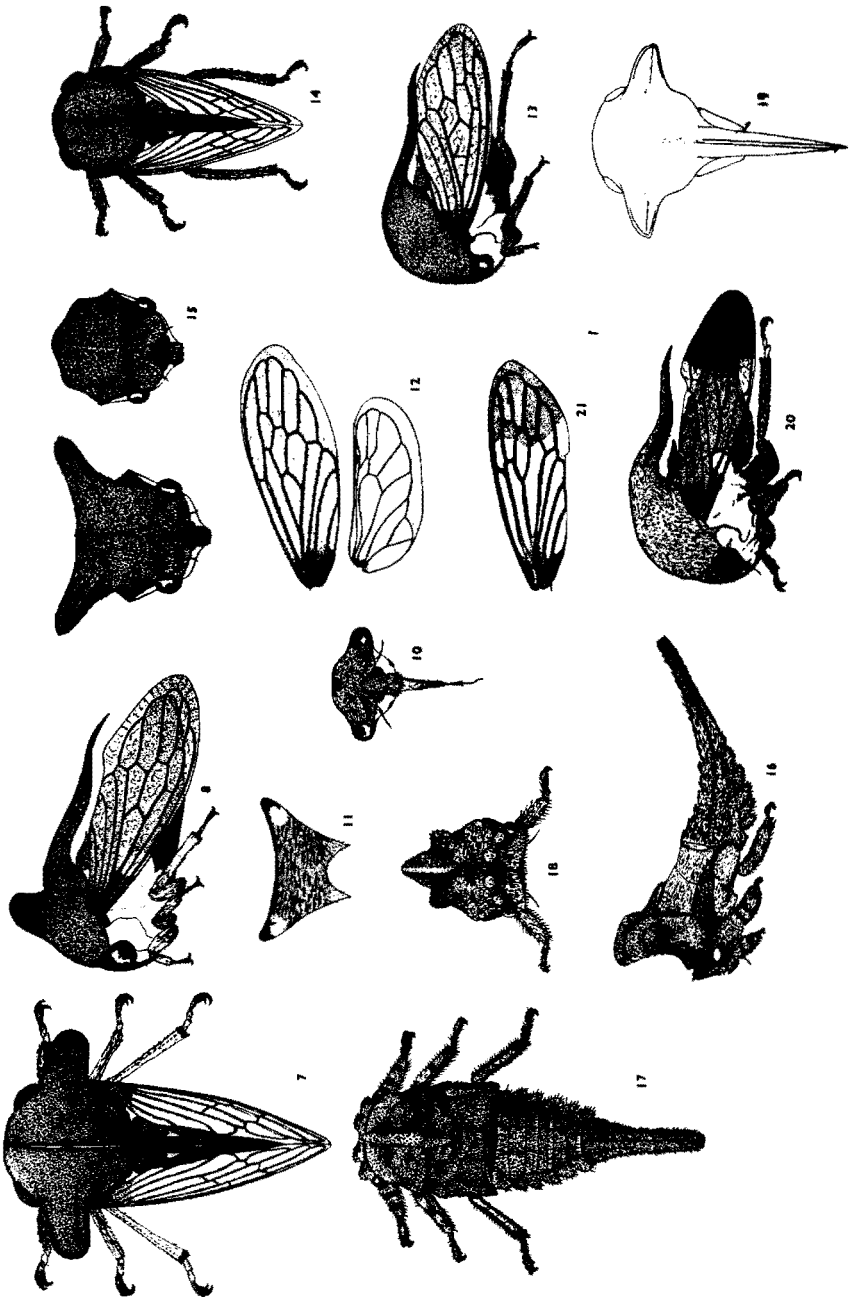
**Centrotus mossopi** sp. n.

Closely allied to the preceding species but differing chiefly in the dark smoky tips of the tegmina, and the more sharply declivous and sinuate posterior process. The female differs also in the somewhat narrower, more posteriorly acute, and more horizontal suprahumeral horns.

**Female:** *Head* about two and a half times wider than long, black, shortly goldenly pilose; base arcuate; eyes dark brown mottled with black; ocelli opalescent, sunken, about equidistant from each other and from the eyes and situated about on a line drawn through the centres of the eyes; a bare shallow depression above each ocellus below the base; inferior margins of genae sloping downwards and very slightly sinuous; clypeus about twice as long as broad, lobate at base and extending below margins of genae for about three quarters its length, shortly goldenly pilose, tip rounded; rostrum reaching to posterior coxae; postgenae densely whitely tomentose; antennae ochraceous with base of flagellum black. *Thorax:* *Pronotum* black, finely punctate, shortly goldenly pilose, metopidium wider than high; suprahumeral horns well developed, about as long as the distance between their bases, almost horizontal, somewhat compressed dorso-ventrally, frontally somewhat arcuate, posteriorly somewhat acute, lateral margins strongly carinate, a short carination above close to posterior margin; posterior process more strongly arched above scutellum, more sharply declivous and more sinuous than in *hobohmi*, reaching well beyond inner angle of tegmina, tricarinate, finely punctate, sparsely, shortly, whitely pilose above, more longly pilose below on basal half; strongly centrally carinate along posterior process, less strongly so on metopidium; humeral angles blunt; sides of thorax densely whitely tomentose. *Tegmina* about two and a half times as long as wide, hyaline, apical third dark smoky brown, somewhat wrinkled, veins brown and well developed, somewhat paler basally, very shortly finely pilose, base very narrowly coriaceous, tip rounded, five apical and two subapical cells. *Legs* black, coxae whitely tomentose, femora and tibiae shortly pilose, posterior tibiae marginally shortly spinose and apically brown, tarsi shortly pilose, posterior pair brown. *Scutellum* about as wide as long, fully exposed, bifid at tip, whitely pilose with hairs lying at right angles to median line, basal angles whitely tomentose, marginally and apically reddish brown. *Abdomen* dark grey above, posterior margins to tergites paler, deeply sparsely punctate; below black with silvery pubescence, whitely tomentose along pleural suture. Length 8 mm. Width across humeral angles 3.25 mm. Width across tips of suprahumeral horns 4.5 mm.

**Male:** As female except for the complete absence of suprahumeral horns. Length 6.5 mm. Width across humeral angles 3 mm.

**Nymph** (last instar). There appears to be no structural difference between this species and *C. hobohmi*. It is, however, somewhat lighter in colour, with the wing pads black, the suprahumeral buds dark brown to black, shading down to ochraceous at the humeral angles.



Holotype ♀, allotype ♂, 17 ♀, 5 ♂ paratypes and five nymphs collected by Mr. M. C. Mossop at Mazoe, S. Rhodesia, on 8 March, 1951.

Holotype and allotype in National Collection of Insects, Pretoria, paratypes in author's collection, Transvaal Museum and British Museum.

**Host Plant:** *Terminalia sericea*.

**Otinotus biformatus** sp. n.

The female is allied to *O. arcuatus* Funk., but differs in the more frontally curved and less conical suprahumeral horns. The male is unlike any described species in that the suprahumeral horns are very short, somewhat triangular and sub-horizontal.

**Female:** *Head* dark chocolate brown, somewhat rugose and sculptured, shortly goldenly pilose, about three times as wide as long; base arcuate; eyes large, somewhat ovate, prominent, dark brown; ocelli large, amber, prominent, closer to each other than to the eyes and situated about on a line drawn through the centres of the eyes; inferior margins of genae sloping downwards, very slightly curved; clypeus about three times as long as basal width, right-angularly lobed at angles of genae, gradually widening from base, tip swollen, truncate and pilose; postgenae whitely tomentose; antennae black.

*Thorax:* *Pronotum* dark chocolate brown, finely and closely punctate, shortly goldenly pilose with recumbent hairs; metopidium wider than high, frontally vertical, finely marginate along cephalic margin, several small bare callosities above internal angles of each eye; median carina dark brown and percurrent; humeral angles large, triangular, prominent, blunt; suprahumeral horns heavy, tricarinate, apical half somewhat dorso-ventrally compressed, extending upward and outward, nearly as long as the distance between their bases, frontal margin somewhat backwardly curved, dorsally narrowly, strongly granulate; these granulations extending backwardly round the disc of the metopidium; posterior process heavy, long, arcuate, tectiform, tricarinate, somewhat amplate below, contiguous with scutellum, very slightly laterally expanded above apex of scutellum, tip somewhat acuminate and extending about midway along the margin of the fourth apical cell of the tegmina; sides of thorax somewhat creamily tomentose. *Tegmina* hyaline,

Explanation of figures 7 to 21.			
7	<i>Centrotus hobohmi</i> sp. n.	♀	Dorsal view.
8.	"	♀	Lateral view.
9.	"	♀	Frontal view.
10.	"	♀	Head.
11.	"	♀	Scutellum.
12.	"	♀	Tegmen and wing.
13.	"	♂	Lateral view.
14.	"	♂	Dorsal view.
15.	"	♂	Frontal view.
16.	"	Nymph (last instar)	lateral view.
17.	"	"	dorsal view.
18.	"	"	frontal view.
19.	<i>Centrotus mossopi</i> sp. n.	♀	Dorsal outline (pronotum).
20.	"	♂	Lateral view.
21.	"		Tegmen.

about three times as long as wide, base creamy brown, narrowly coriaceous, veins prominent, brown, five apical and three sub-apical cells. *Wings* with **four apical cells**. *Legs* brown with basal joints much darker and lightly tomentose, posterior tibiae and basal joint of tarsi ochraceous; finely punctate, shortly goldenly pilose. *Scutellum* laterally well exposed, wider than long, apex bifid, lateral angles and tips lightly tomentose. Length 9 mm. Width across suprahumeral horns 5.75 mm. Width across humeral angles 4.5 mm.

Holotype ♀, allotype ♂, 6 ♀, 1 ♂ paratypes from Ngwabeni, Nr. Nqutu, Zululand, 20 March, 1951, A. L. Capener. Holotype and allotype in author's collection, ♂ and ♀ paratypes in Transvaal Museum, ♀ paratype in British Museum.

**Host Plant:** *Acacia* sp.

***Platybelus mutabilis* sp. n.**

Nearest to *P. macrocerus* Pelaez (1936) but differing in the general colour, and in the shape and direction of the suprahumeral horns.

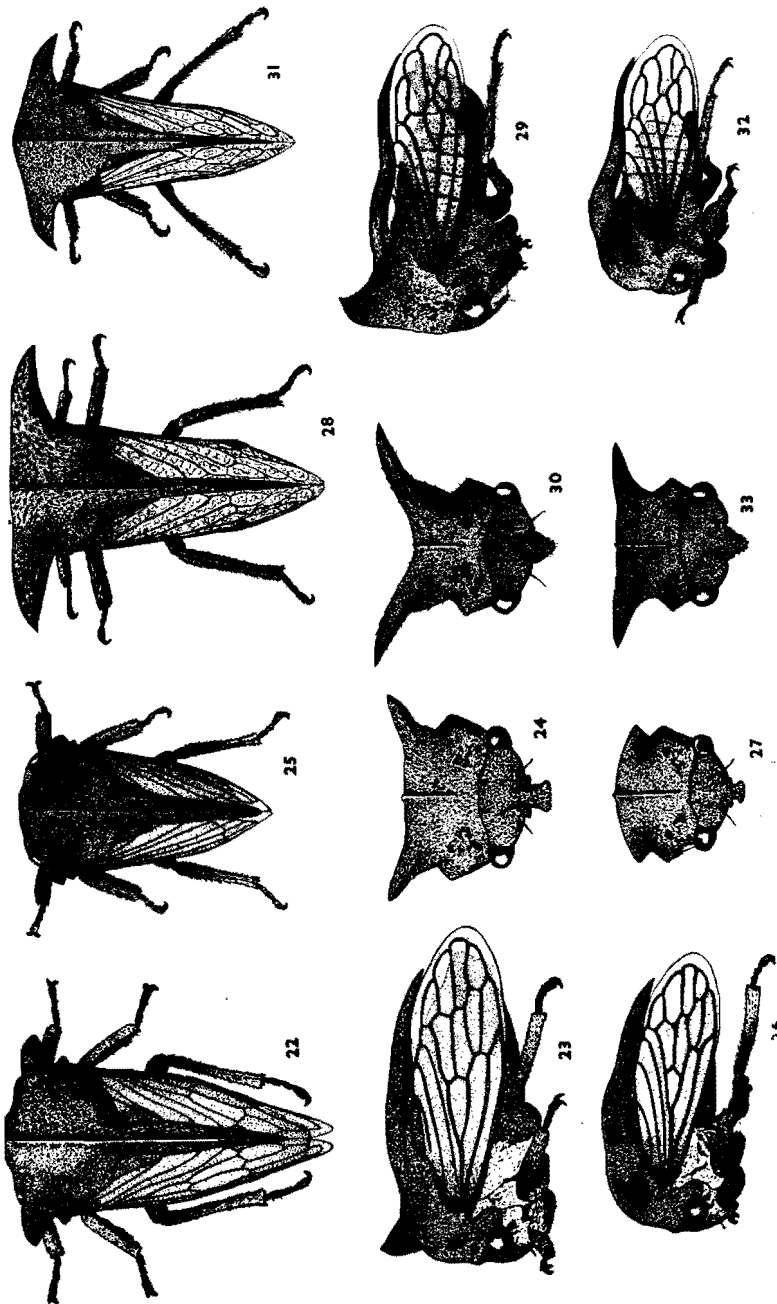
**Female:** *Head* nearly three times as wide as long, dark brown, sculptured, thickly, shortly, whitely pilose; base very slightly arcuate and weakly sinuous; inferior margins of genae slightly oblique and a little convex; eyes globose, brown, mottled with darker; ocelli small, brown, about equidistant from each other and from the eyes and situated above a line drawn through the centres of the eyes; clypeus somewhat diamond shaped, tip rounded, longitudinally sulcate on either side, shortly pilose, rostrum almost reaching posterior coxae; postgenae whitely sericeous; antennae brown, basal joint paler.

*Thorax:* *Pronotum* dark brown, sparsely deeply punctate, shortly whitely pilose; metopidium wider than high; suprahumeral horns as long as the distance between their bases, upwardly and outwardly directed and frontally about at right angles to the median line, tips acute and slightly decurved, strongly marginally carinate, a central carina below and another above; posterior process rising slightly above scutellum, weakly arched and impinging on apex of scutellum, thence weakly sinuous and acuminate to tip which reaches about half way along the margin of the fourth apical tegminal cell, tectiform and tricarinate; humeral angles triangular, prominent; sides of thorax dark brown, shortly whitely pilose. *Tegmina* about three times as long as wide, clear hyaline, veins dark brown and slightly whitely pilose, pterostigma well defined, five apical and two subapical cells, apex rounded and

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Explanation of figures 22 to 33.

22.	<i>Otinotus biformatus</i> sp. n.	♀	Dorsal view.
23.	"	♀	Lateral view.
24.	"	♀	Frontal view.
25.	"	♂	Dorsal view.
26.	"	♂	Lateral view.
27.	"	♂	Frontal view.
28.	<i>Platybelus mutabilis</i> sp. n.	♀	Dorsal view.
29.	"	♀	Lateral view.
30.	"	♀	Frontal view.
31.	"	♂	Dorsal view.
32.	"	♂	Lateral view.
33.	"	♂	Frontal view.



limbus wide. *Wings* with three apical areas. *Legs* simple, dark brown. *Scutellum* completely exposed, about as long as wide, whitely pilose, apex upturned and bifid. *Abdomen* above greyish, sparsely, deeply punctate, not pubescent; below thickly whitish pilose. Length 6 mm. Width across suprahumeral horns 4.5 mm. Width across humeral angles 2.7 mm.

**Male:** Differing from the female in its darker, almost black colour, in the horizontal and more backwardly curved suprahumeral horns, in the slightly more rounded inferior margins of the genae, in the more faintly sulcate margins of the clypeus and the darker femora. Length 4.25 mm. Width across suprahumeral horns 3.25 mm. Width across humeral angles 2.5 mm.

Holotype ♀, allotype ♂, 3 ♀ paratypes, collected by Mr. G. Hobohm at Abachaus, Otjiwarango, South West Africa in March and April, 1950, and April, 1951. The holotype and allotype which are in the Transvaal Museum, were taken *in cop.* and remained so until relaxed for pinning. Female paratypes in author's collection and British Museum.

**Host Plant:** *Acacia fleckii*.

***Platybelus sericeus* sp. n.**

Near *P. brunneus* Funk. but differing in the female, in the much shorter suprahumeral horns, in the less strongly arched and un-ampliate posterior process; in the male, in the more strongly arched and more sinuous posterior process. Small, castaneous brown, thickly whitish sericeous; posterior process sinuous and reaching well beyond inner tegminal angle; suprahumeral horns short and rounded in ♀, absent in ♂.

**Female:** *Head* wider than long, dark brown, finely whitish pilose; base arcuate and sinuous; margins of genae oblique and slightly curved; eyes pale amber, moderately large; ocelli pale amber, slightly raised, slightly nearer to the eyes than to each other, and very slightly above a line drawn through the centres of the eyes; clypeus longer than broad, extending about two thirds its length below margins of genae, longitudinally sulcate on either side; rostrum reaching to base of posterior coxae; antennae pale brown, basal joint paler; postgenae thickly whitely sericeous.

**Thorax:** *Pronotum* castaneous brown, whitish sericeous and finely goldenly pilose; metopidium broader than high, cephalic margin very slightly marginate; suprahumeral horns broad at base, shorter than the distance between their bases, tips rounded, somewhat angulate posteriorly, marginally carinate, upwardly and outwardly directed; humeral angles blunt, slightly wider than the distance between the tips of the suprahumeral horns; posterior process strong at base, tectiform, tricarinate, rising just above scutellum, slightly curved above it and impinging on its tip, sinuous and acuminate to tip which reaches the fourth apical tegminal cell; median carina percurrent, becoming faint towards the cephalic margin; sides of thorax thickly whitely sericeous. *Tegmina* about twice as long as wide, base coriaceous, tips rounded, veins prominent and whitely sericeous, very variable as regards number and arrangement of spurious veins, pterostigma large, brown, slightly sericeous, a

dark fascia extending from just beyond inner angle into fourth apical cell and another from between the first and second anal veins about halfway across tegmina, five apical and two subapical cells, limbus wide. *Wings* with three apical cells. *Legs* basally dark brown, thickly whitely sericeous, tibiae castaneous and whitely pilose, tarsi paler, first joint of posterior tarsi about twice as long as second joint. *Scutellum* slightly wider than long, bifid at apex, finely goldenly pilose, basal angles thickly whitely sericeous. *Abdomen* blackish brown, deeply punctate, posterior margins of tergites greyish, whitely sericeous below. Length 4.5 mm. Width across humeral angles 2.5 mm. Width across suprahumeral horns 2 mm.

**Male:** Differing from the female in the following respects: darker brown and less sericeous above, the clypeus is apically more pointed and only faintly longitudinally sulcate, the suprahumeral horns are entirely absent (in only one specimen is there an indication of their presence by a small carina which is indicated in the figures by a black line); the posterior process is somewhat more arcuate above the scutellum. Length 4 mm. Width across humeral angles 2 mm.

**Nymph** (last instar) small, dark brownish, darker on head, crest and wing pads, thickly whitely pubescent. *Head* inverted heart-shaped; eyes pale, prominent and slightly pilose; ocelli sunken and obscure, nearer to the eyes than to each other and about on a line drawn through the centres of the eyes; a shallow tubercle on base above each ocellus; clypeus not visible from front; rostrum reaching posterior coxae. *Pronotum* about as high as wide, sloping slightly backwards, curved at apex like a helmet, posterior process extending backwards over two thirds of mesothorax. *Abdomen* with six visible segments, a small tubercle on each tergite on either side of the median line; of the visible segments two to six bear a lamellated plate on the lateral margins; anal tube as long as the rest of the abdominal segments together; tibiae triangular in section.

Holotype ♀, allotype ♂, 43 ♀, 20 ♂ paratypes, collected at Abachaus, Otjiwarango, South West Africa in March and April, 1951, by Mr. G. Hobohmi.

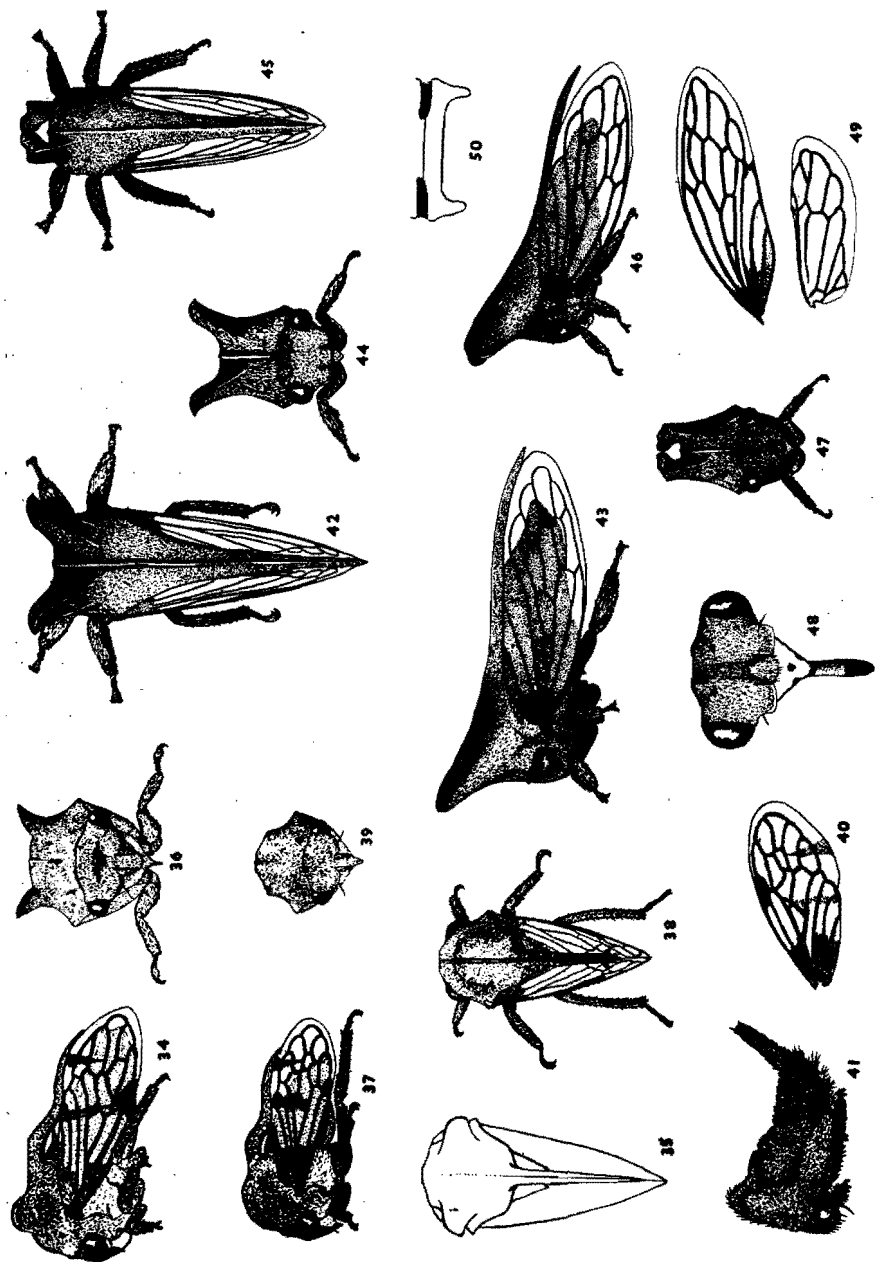
Holotype, allotype and paratypes in Transvaal Museum, paratypes in author's collection, British Museum, National Collection of Insects, Pretoria.

**Host Plant:** *Terminalia sericea*.

### **Xiphistes biformis** sp. n.

Female resembling *X. pallidus* Buckt. (1903), but much smaller, more elongate, with suprahumeral horns more forwardly and less upwardly directed, and the posterior process longer. The suprahumeral horns of the male are quite unlike any previously described species, being abruptly inwardly curved and contiguous at their tips.

Small, brownish, thickly clothed with dull, pale, greyish ochraceous pubescence, posterior process reaching to tips of tegmina, suprahumeral horns forwardly and slightly upwardly directed, divaricate in female, sharply inwardly directed in male and contiguous at tips.



**Female:** *Head* subquadrate, almost as wide as long, dark brown, sculptured, shortly, thickly, dull greyish ochraceously pubescent; base arcuate; eyes pale amber, slightly receding; ocelli dull, clearly defined, closer to the eyes than to each other and situated well above a line drawn through the centres of the eyes; inferior margins of genae somewhat excavated below eyes, thence rectangularly lobate; clypeus about equal in width to genal lobes, tip more or less truncate and pilose, not extending below margins of genae; basal joint of rostrum thickly whitely tomentose with a bare central black macula; rostrum ochraceous with black tip, reaching to base of posterior coxae.

*Thorax:* *Pronotum* brown, thickly covered with short dull pale greyish ochraceous pubescence; cephalic margin finely marginate; metopidium slightly wider than high; humeral angles rather shallow and blunt; suprahumeral horns extending forwards, upwards and outwards, longer than the distance between their bases, their tips abruptly rounded and outwardly acute, tricarinate; posterior process long and slender, tectiform, strongly centrally and faintly laterally carinate, straight for two thirds of its length, then gradually decurved following the curve of the tegmina, extending very slightly beyond the apex of the tegmina; medial carina strongly percurrent; sides of thorax brownish and thickly clothed with greyish ochraceous pubescence. *Tegmina* more than three times as long as broad, subhyaline, veins pale brown and well defined, apex somewhat acute, five apical and three subapical cells. *Wings* with four apical cells and wide limbus. *Legs* basally dark brown and whitishly tomentose, tibiae somewhat compressed and paler, tarsi pale brown. *Scutellum* entirely concealed, pale brown, about as wide as posterior process at base and reduced to two rounded teeth on a narrow band. *Abdomen* above, dull brownish with a grape-like bloom, sparsely and deeply punctate, posterior margins of tergites creamy, a slight medial swelling on tergites four to seven; below, thickly whitely tomentose. Length 6.5 mm. Width across suprahumeral horns 2.25 mm.

**Male:** Differing from the female in the form of the suprahumeral horns, which are at first more or less parallel, then sharply inwardly directed and somewhat granulate, tips contiguous forming an arch over the metopidium.

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Explanation of figures 34 to 50.

34.	<i>Platybelus sericeus</i> sp. n.	♀	Lateral view.
35.	"	♀	Dorsal outline.
36.	"	♀	Frontal view.
37.	"	♂	Lateral view.
38.	"	♂	Dorsal view.
39.	"	♂	Frontal view.
40.	"	"	Tegmen.
41.	"	"	Nymph (last instar) lateral view.
42.	<i>Xiphistes bififormis</i> sp. n.	♀	Dorsal view.
43.	"	♀	Lateral view.
44.	"	♀	Frontal view.
45.	"	♂	Dorsal view.
46.	"	♂	Lateral view.
47.	"	♂	Frontal view.
48.	"	"	Head.
49.	"	"	Tegmen and wing.
50.	"	"	Scutellum.

The posterior process is very slightly shorter than that of the female. Length 5.5 mm. Width at lateral angles of suprahumeral horns 1.5 mm.

Holotype ♀, allotype ♂, 32 ♀, 24 ♂ paratypes from the banks of the Umtentweni River, Natal, in July, 1950, and 1951.

Holotype, allotype and paratypes in author's collection, paratypes in Transvaal Museum, National Collection of Insects, Pretoria, British Museum.

**Host Plant:** Practically all the specimens were beaten from *Milettia caffra* and this appears to be the host plant. I made a special trip to Umtentweni in March, 1951, in order to find the nymphs of this species. Unfortunately, despite thorough beating and sweeping in the vicinity of previous captures, neither nymphs nor adults could be found at this time, although a good number of adults were again found in July.

#### ACKNOWLEDGMENTS

I should like to record my thanks to Mr. G. Hobohm, of Abachaus, Otjiwarango, S.W.A., for his untiring efforts in collecting so much valuable membracid material, including three of the species herein described; to Dr. H. K. Munro for passing on to me the specimens collected by Mr. M. C. Mossop, and to Dr. G. van Son, of the Transvaal Museum, for his ever-ready help over many years.

#### CONCLUSION

May I appeal to entomologists, and particularly to field workers for membracid material for study. Fresh material is specially desired, and nymphal forms would be particularly welcome when they can be definitely associated with a certain species, as little is known of them and they will provide valuable clues in the correct interpretation of the systematic relationship. Information as to host plants and approximate altitude would also be valuable.

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